NASA Briefing for Unidata

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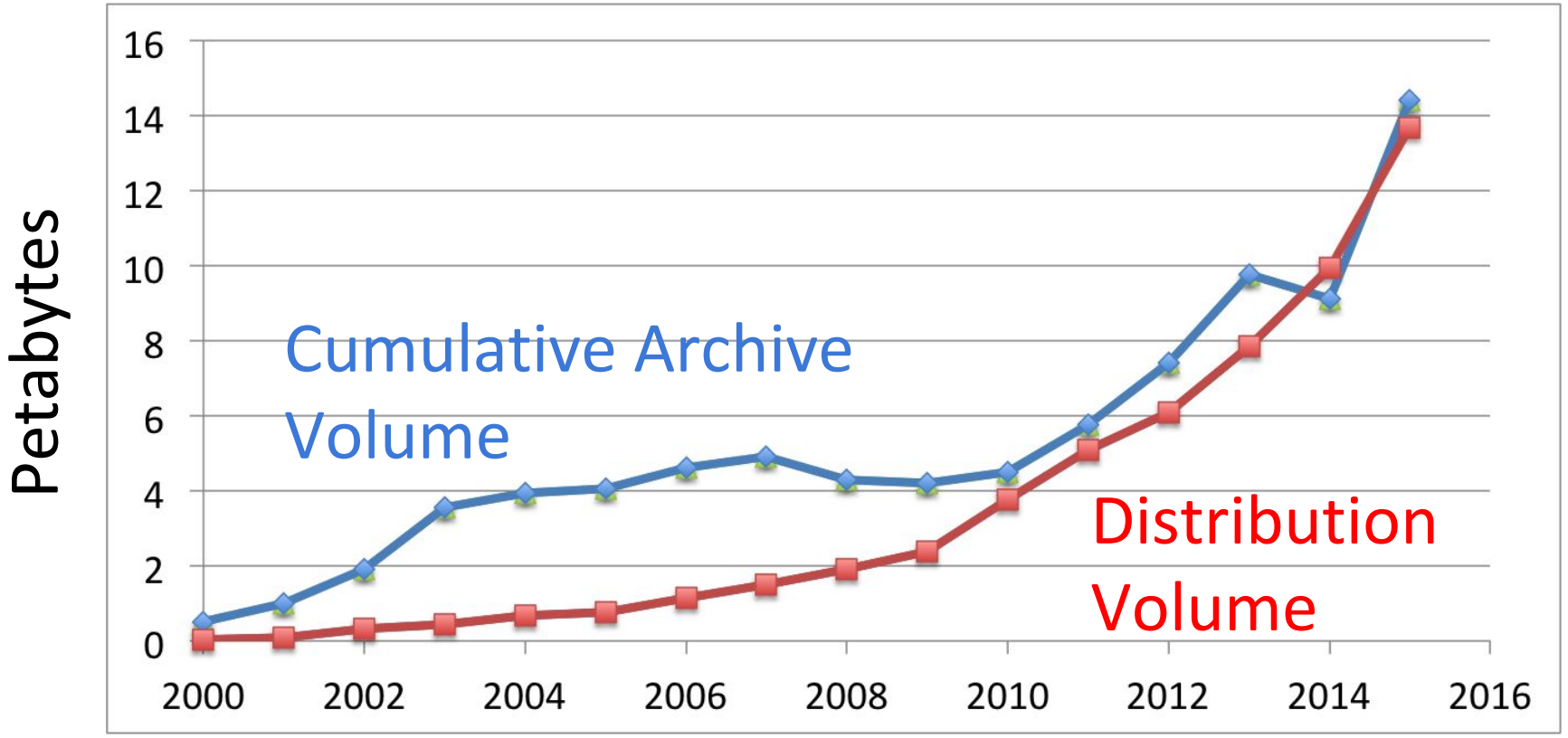
Cloud Computing

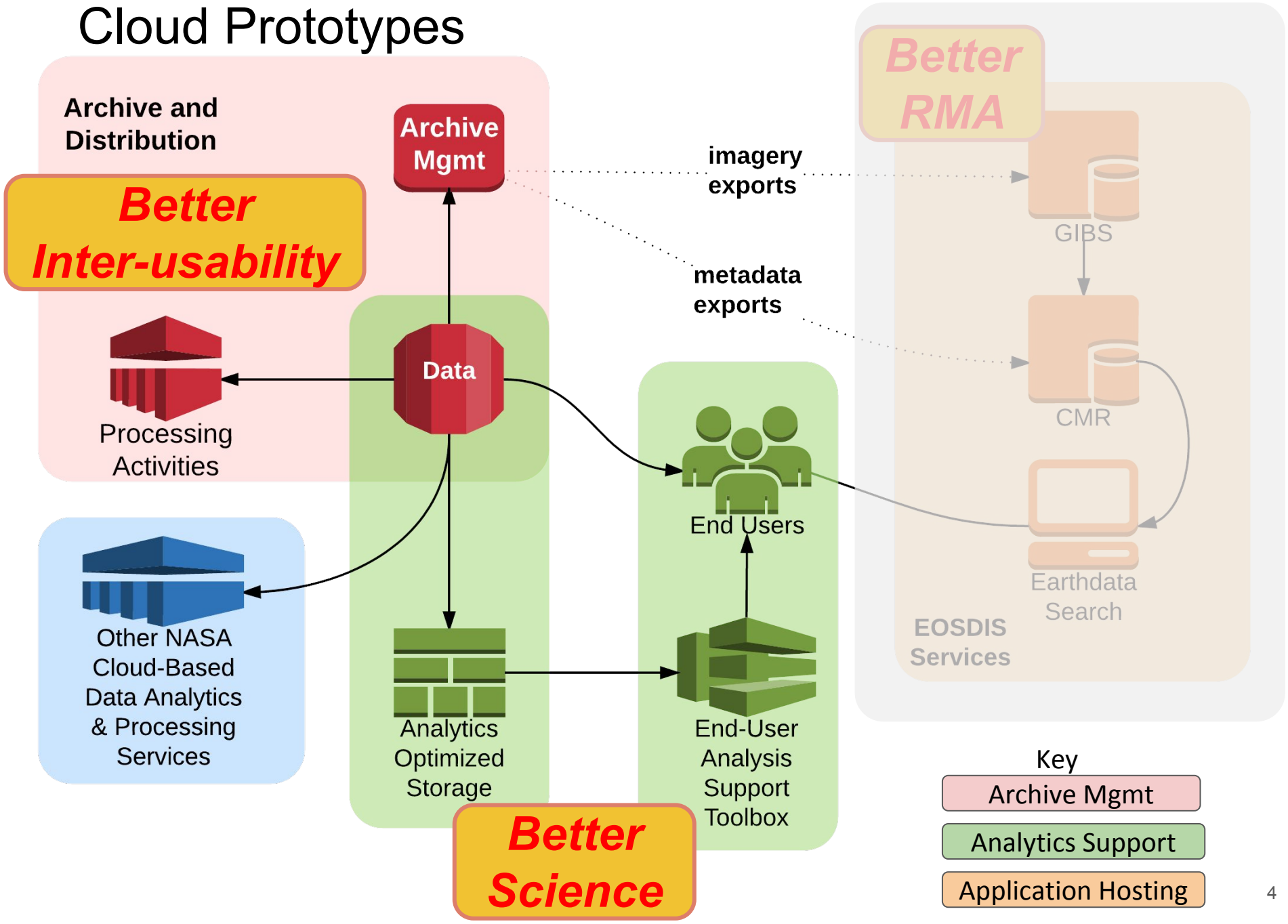
High-level direction to “consider cloud computing” to satisfy EOSDIS Big Data requirements

EOSDIS Works with (pretty) Big Data

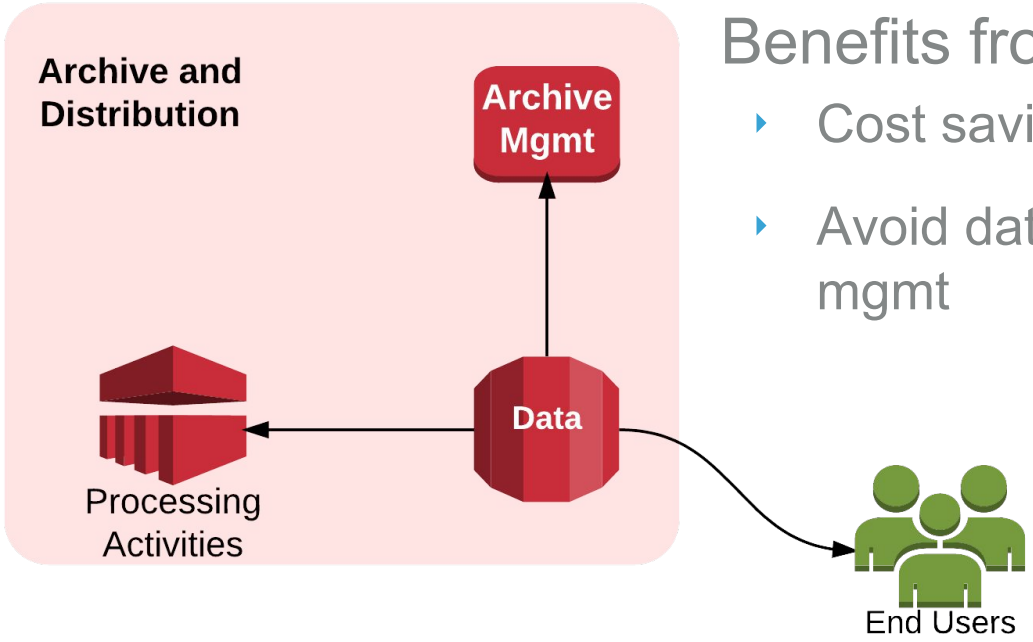
…Volume



Cloud Prototypes



1 Archive and Distribution Prototype(s)

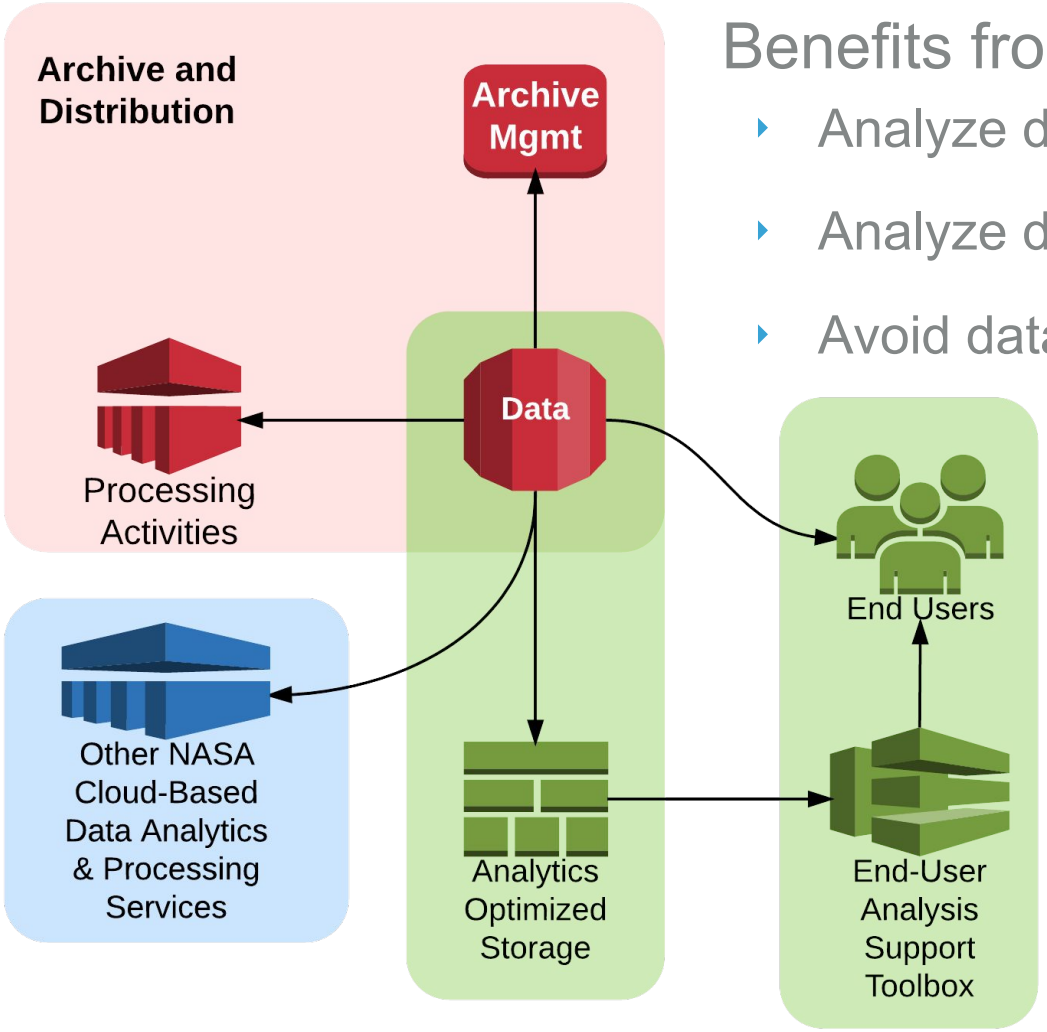


Benefits from Archive in the Cloud

- Cost savings for storage of Big Data?
- Avoid data downloading and local data mgmt

- Alaska Satellite Facility Web Object Storage prototype
  - Distribute Sentinel radar data from Amazon storage
- Global Imagery Browse Service in the Cloud
- Ingest and Archive management prototype

2 Cloud Analytics Prototypes



Benefits from Cloud Analytics

- Analyze data at scale
- Analyze datasets together easily
- Avoid data downloading and local mgmt

Analysis support toolbox to attract users to cloud analytics

- Community open source tools
- DAAC-developed tools
- Cloud analytics examples and recipes

OPeNDAP + HDF in Cloud Web Object Storage

Web Object Storage ≠ File System

- OPeNDAP needs high-performance internal random access

Approaches

- Use file system emulator (e.g., FUSe)
- Pull files from WOS and cache on EBS
- Store variables (or chunks) as objects
- Use HTTP range gets based on maps of data

EOSDIS Standards Office Interoperability Recommendations

Dataset Interoperability Recommendations for Earth Science

1. Maximize HDF5/netCDF4 interoperability via API accessibility
2. Include Basic CF Attributes
3. Use CF “bounds” attributes
4. Verify CF compliance
5. Distinguish clearly between HDF and netCDF packing conventions
6. When to employ packing attributes
7. Mapping between ACDD and ISO
8. Group Structures in HDF5 and netCDF4 Files
9. Make HDF5 files netCDF4-Compatible and CF-compliant within Groups
10. Include time dimension in grid structured data
11. Order dimensions to facilitate readability of grid structure datasets
12. Consider “balanced” chunking for 3-D datasets in grid structures
13. Include datum attributes for data in grid structures

HDF Product Designer

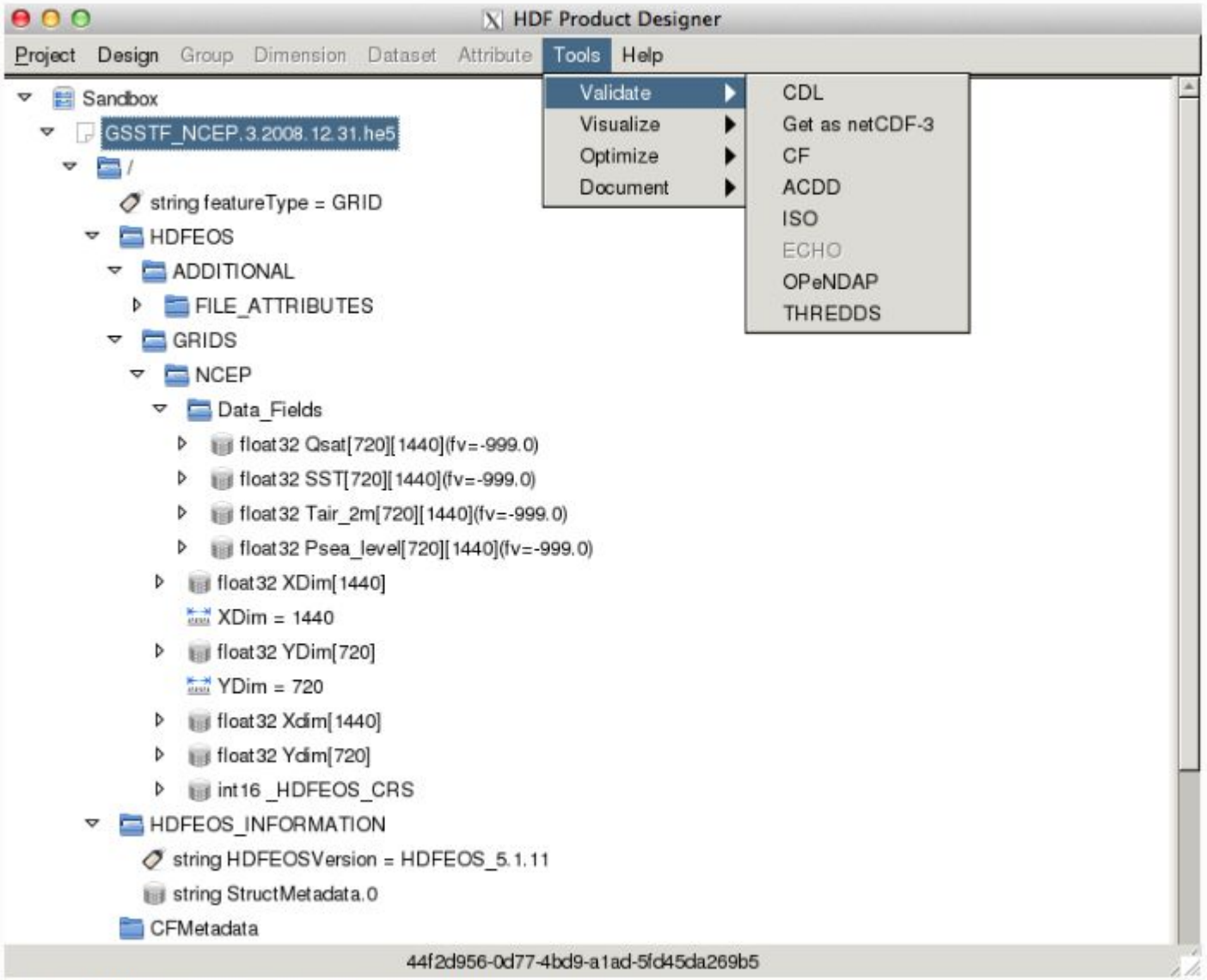


Fig. 25 HPD Desktop Tools menu for HPD Online tools